Indoor air quality assessment and lung functions among children in preschool at Selangor, Malaysia

ABSTRACT

Background: Poor indoor air quality (IAQ) has been associated with decreased growth in lung function among children. However, only little is known about the impact of poor IAQ. A cross-sectional comparative study was carried out among 39 preschools located in Selangor, Malaysia with 630 children from preschools located in urban, suburban and rural area. Objective: The aim of this study is to assess current IAQ status of preschools located in urban, suburban and rural area in Selangor and to compare the implications on children's lung functions. Results: There was a significant difference between the indoor concentration of carbon monoxide (CO), particulate matter (PM) PM10, PM2.5 and Volatile Organic compounds (VOCs)($p = 0.001$; $p = 0.005$; $p = 0.005$; $p = 0.006$) among the studied preschools. Urban area preschools have higher CO, PM10 and PM2.5 concentration as compared to preschools from suburban and rural area. Forced Vital Capacity (FVC), Forced Expiratory Volume in one second (FEV1), FVC% predicted and FEV1% predicted values were significantly lower among children from urban and suburban area preschools [($F = 5.708$, $p = 0.003$); ($F = 6.985$, $p = 0.001$); ($F = 15.219$, $p = 0.001$); ($F = 16.441$, $p = 0.001$)]. Conclusion: The findings concluded that exposures to poor IAQ might increase the risk of getting lung function abnormality among children.

Keyword: Preschool children; Indoor air quality; Lung function